NOTES.

We deeply regret to see the announcement that Dr. Isaac Roberts, F.R.S., died at Crowborough on Sunday last.

The monument erected in the Place Breteuil, Paris, to the memory of Pasteur, was unveiled on July 16 by President Loubet. The ceremony was attended by the members of the diplomatic body, by prominent men of science, and by representative Government officials. Speeches eulogising the services rendered to science by Pasteur were delivered by the French Minister of Public Instruction, the Prefect of the Seine, and the president of the Paris Municipal Council. Prof. Herrera, of the University of Brussels, spoke in the name of the foreign subscribers. The monument is the work of M. Falguière.

The Postmaster-General introduced into the House of Commons on Monday a Bill for the regulation of wireless telegraphy. The Bill makes no attempt to create a State monopoly in wireless telegraphy, but merely aims at regulating its use in the country in a way that shall prevent the undue clashing of conflicting interests. The Government has at present no jurisdiction over telegraphy unless both ends of the system are within the United Kingdom or within the three-mile maritime limit. It is proposed to deal with the matter by means of licences. It is obvious that the peculiar conditions under which wireless telegraphy is worked, particularly the fact that neighbouring installations cannot at present be operated without interfering with one another, make it very desirable that the Government should be able to exercise a certain amount of authority in such questions, for example, as the selection of sites for transmitting stations. The great strategical value of wireless telegraphy to the Navy makes the matter of still more importance.

In connection with wireless telegraphy, we note that Mr. Duddell has recently been carrying out some experiments for the Post Office in Bushey Park with the new thermogalvanometer which he exhibited at the recent Royal Society soiree. This instrument is capable of directly measuring the current received by the aërial at the receiving station, and thus affords a means of making scientific experiments on many of the problems connected with the subject which have long waited for a satisfactory elucidation.

The weather report issued by the Meteorological Office for the week ending July 16 shows that from the beginning of the year the rainfall has equalled or exceeded the mean in all districts except the north-east and east of England and the midland counties, where it is still an inch below the average. In the north of Scotland the fall is 4½ inches above the mean. The temperature for the week was above the mean in all districts, amounting to 6° in the midland counties, where the maxima reached 85°. The same value was recorded in south and east England. On Sunday last the maxima were still higher, reaching 91° in parts of Hertfordshire. Thunderstorms have occurred in many places.

The Bombay branch of the Royal Asiatic Society will celebrate its centenary on January 17, 1905.

The International Botanical Congress will meet in Vienna in 1905 from June 12 to June 18.

The deaths are announced of Prof. Albert Rilliet, of Geneva; of Prof. V. Merz, formerly of Zürich; and of Prof. Karl Bopp, formerly of Stuttgart.

The death is announced of Prof. F. Knapp at the age of ninety-one. Prof. Knapp was for many years professor of applied chemistry in the Chemical Institute at Brunswick. He was a former student and son-in-law of Liebig.

Signor Pietro Blaserna has been elected president and Signor Francesco d'Ovidio vice-president of the Reale Accademia dei Lincei, of Rome; Prof. Giuseppe Gabrielli has been appointed librarian.

Dr. E. Rupp, of Marburg, and Dr. F. Dolezalek, of Berlin, have been raised to the rank of professors; Prof. F. Schilling, of Göttingen, has been appointed at the technical school of Danzig, and Prof. von Margold, of Aachen, has also been appointed there, both as professors of mathematics.

The specimens and other material collected by the Scottish Antarctic Expedition have arrived at the headquarters of the expedition in Edinburgh. The *Scotia*, with the members of the expedition on board, is expected to reach the Clyde to-day.

Provisional arrangements have been made by the American Society of Civil Engineers and the Canadian Society of Civil Engineers for the forthcoming visit of members of the Institution of Civil Engineers to the United States and Canada. Broadly, the visit will commence with a week spent in New York and the neighbourhood. Thence, a journey will be made to Montreal by a special train placed at the disposal of the party. A week will be spent in Canada, for which similar special travelling facilities will be provided; and this part of the tour will be concluded at Chicago, whence the party will proceed (again by special train) to St. Louis, which is expected to be reached on September 30. The party will leave Liverpool by the Cunard ss. *Etruria* on September 3, and may expect to reach New York on September 10.

The following is an abridged summary of the prizes offered by the Belgian Academy for 1904 and 1905:—For 1904, in mathematics and physics, critical phenomena in physics, viscosity of liquids, study of n-linear forms where $n>3$, thermal conductivity of liquids and solutions, each a prize of 600 francs; unipolar induction of Weber, 800 francs. In natural sciences, the Cambrian rocks of Stavelot (Belgium), 800 francs; modifications produced in minerals by pressure, 600 francs; development of Amphioxus (see *Bulletin*, 1904, No. 4, for corrected announcement), 1000 francs; effects of osmotic pressure in animal life, and Devonian flora of Belgium, each 600 francs; heterœcism of parasitic fungi, 800 francs; and physiological action of histones, 1000 francs. All memoirs to be written in French or Flemish, and sent in before August 1, 1904. For 1905, in mathematics and physics, combinations of halogens, 1000 francs; physical phenomena accompanying mutual dissociation of liquids, 800 francs; linear complexes of the third order, 600 francs; principal terms in the periodic deviations of the vertical, 600 francs. In natural science for the same year, effect of albuminoids in nutrition, reproduction of Dicyemidæ, formations intermediate between the Bruxellian and Tongrian in Brabant, geological age of certain Oligocene deposits in Belgium, sexuality of the individuals resulting from division of a single ovum in certain diœcious plants; prizes, 1000 francs for each of these five subjects; silicates of Belgian rocks, &c., 800 francs. In addition to these ordinary prizes the academy will award the following:—June 30, 1905, a Charles Lemaire prize relating to public works; June 30, 1904, a Louis Melsens prize for applied chemistry or physics; December 31, 1904 a Charles Lagrange prize for terrestrial physics; on May 1, 1906, a Selys Longchamps prize for researches on the Belgian fauna; on December 31, 1904, a Théophile Gluge prize for physiology; and in 1906 a François Deruyts prize for higher synthetic or analytic geometry.

MR. BALFOUR presided on July 14 at the annual dinner of the Royal Economic Society, of which he is vice-president. In proposing the toast "The Royal Economic Society," he said in the course of his remarks:—"If a man of science once lets the public think that he is speaking not in the interests of his science, but in the interests of his party, if he once allows the view to get abroad that his expression of opinion may have its origin in his scientific views, but has a double parentage, and that the scientific views are in some sense moulded in conformity with our political differences, his whole authority from that moment will absolutely vanish. So far as political economy is a science at all—and I am the last person to deny it that proud title to distinction—it must be absolutely international in its character. People talk of an English, a German, a French, or an American school of political economy. In so far as they talk in that way they show conclusively that political economy to that extent has not yet thoroughly earned its title to a position among the sciences. There is no such thing as English physics as distinguished from German physics, or German mathematics as distinguished from French mathematics. I do not say there may not be certain schools having the impress of great teachers belonging to one or the other nationality, but *qua* science and as a science political economy must be, and is, and will be, absolutely international in its character. Let everybody who has the chance, not only treat economic problems in a strictly objective spirit, but let him make it clear that that is the spirit in which he is trying to treat them. Thus and thus only will the student and the investigator obtain that authority over the changing forces of ordinary public opinion which it should be the proudest boast of men of science to obtain, which if they truly pursue science in a scientific spirit they have always obtained in the past, and I cannot doubt for a moment they will always obtain in the future."

The second part of vol. v. of *Annotationes Zoologicae Japonenses* contains the description of a new deep-sea polychæte annelid by Prof. A. Isuka, additional notes on Japanese cicadas by Prof. S. Matsumura, and the first part of a biological and geological essay on the island of Hokkaido by Mr. E. Klocke.

IN reply to a question of Mr. Morrell, not answered orally in the House of Commons, Sir W. Anson stated that the Board of Education is aware that those interested in agricultural investigation recognise the value of the drift maps prepared by the Geological Survey as a basis for soil maps. Superficial deposits are being mapped in all districts where work is going on in connection with the survey. Thirty-five 6-inch maps of North Staffordshire have been published with drift, and others of South Wales and of the area around Leicester are in course of preparation for publication. The board does not contemplate the publication of drift maps on the 6-inch scale for the entire country, but manuscript maps of any part surveyed on this scale may be obtained at the cost of copying, and whatever information with reference to superficial deposits the officers of the survey have shown upon their field maps of other parts of the United Kingdom is available for reference at the offices of the Geological Survey.

IN *La Nature* of July 9, M. J. R. Plumandon, of the Puy de Dôme Observatory, contributed an interesting article on the dryness of the air. "Relative humidity," or the percentage of saturation of the air with aqueous vapour, plays a more important part in meteorology than "absolute humidity"; its variations produce or dissipate clouds, and give rise to fine or wet weather, it is always irregularly disseminated in the atmosphere, its diurnal variation following inversely the range of temperature, and its annual variation generally exhibits a maximum in winter and a minimum in summer. But almost everywhere it exhibits another minimum in spring-time which frequently exceeds that of summer. The minima, or in other words the periods of dryness of the air, present the greatest interest, owing to their irregularity both as regards date and intensity. M. Plumandon shows by means of very clear diagrams that the annual minimum is more marked, and occurs at varying periods, according to the greater altitude of the station. Near Paris, at a height of 50 metres, it always occurs in spring, while on the summit of the Pic du Midi (2859 metres) it occurs at all seasons. At Toulouse (194 metres) the greatest dryness of the air occurs nearly always in summer, but sometimes also in spring. At Clermont-Ferrand (338 metres) it occurred in spring in twenty-one years out of twenty-five, and at the summit of the Eiffel Tower (also 338 metres) it occurred in March or April in seven years out of eleven. On the Puy de Dôme (1467 metres) it took place in twenty-one years out of twenty-two during the cold season, between September 20 and March 1. The diagrams also show the intensity of the minima in the various months.

M. POTIER has presented a large and valuable collection of pamphlets and works on physics to the French Physical Society for distribution among any members of the society who are interested in the particular branches of which they treat.

IN several recent numbers both in this and last year's volumes of the *Bulletin international* of the Cracow Academy, Prof. Ladislaus Natanson discusses the phenomenon of accidental double refraction in liquids and its connection with the theory of relaxation. The author further criticises papers by M. St. Zaremba, who also contributes a number of writings on the same subject to the same journal.

IN the June number of the *Journal* of the Royal Microscopical Society, Mr. Keith Lucas describes a microscope in which the usual planed sides of the body-tube and limb are replaced by geometric slides. The instrument thus involves an adaptation to biological and other microscopes of a device the use of which has hitherto been generally restricted to measuring microscopes.

FROM Messrs. Ulrico Hoepli, of Milan, we have received the latest issue of their "Biblioteca scientifico-politecnica," a catalogue extending to more than three hundred pages, and comprising scientific and technical works and periodicals published both in Italy and in other countries, up to the end of 1903. In all cases where foreign works have been translated into Italian the translation is mentioned in this catalogue.

A SECOND and enlarged edition has been issued of Prof. Augusto Righi's small book on "La moderna teoria dei fenomeni fisici," in which the author describes modern views on radio-activity, ions, and electrons. The book forms the third of a series published by Nicola Zanichelli, of Bologna, under the title "Attualità scientifiche." It extends over 165 pages, and contains a fairly complete bibliography of the subject.

IN a paper on "Edge Corrections in Condensers," communicated to the *Proceedings* of the American Academy of Arts and Sciences, Mr. J. G. Coffin works out a number of electrostatical problems in two dimensions by the conformal transformation of Schwarz and Christoffel. The problems here considered include as particular cases many of the cases solved in Prof. J. J. Thomson's book, and they have application to condensers, such as one formed of two silvered glass plates, the capacities of which have not previously been determined.

IN his presidential address to a joint meeting of the American Physical and Mathematical Societies, delivered in February last, Mr. Arthur G. Webster chose as his subject "Some Practical Aspects of the Relations between Physics and Mathematics." The address has been reprinted in the *Physical Review* for April, and deals with the work of the late Prof. Willard Gibbs, the endowment of research, and the relative parts played by mathematical and physical teaching and general culture in the education of the physicist in schools and colleges.

SOME interesting properties relating to the polarisation of electrodes are described by M. E. Rothé in the *Bulletin* of the French Physical Society, No. 214. In particular the author obtained a deposit of hydrogen on a platinum wire with a single Daniell cell when the anode was a large lamina, although 1.7 volts would be required to decompose water in ordinary circumstances. This deposit ceased when the anode became polarised by the absorption of oxygen. It thus appears that gas may be deposited on a *single* electrode when the electromotive force is just sufficient to overcome the counter-electromotive force of that electrode alone.

AN account of the department of international research in terrestrial magnetism of the Carnegie Institution is given in *Terrestrial Magnetism and Atmospheric Electricity,* ix., 1. The object of the department will be to investigate such problems of world-wide interest as relate to the magnetic and electric conditions of the earth and its atmosphere, not specifically the subject of inquiry of any one country but of international concern and benefit. Among the problems suggested are a magnetic survey of ocean areas and unexplored regions, international observations of the variations, including the establishment of secular variation or repeat stations throughout the globe, observations in ocean depths and atmospheric regions (for which the first step consists in devising suitable instruments), and other problems.

AT the recent show of the Royal Agricultural Society, the new Just-Hatmaker process for drying milk was exhibited. The milk is fed continuously on two cylinders, one-eighth of an inch apart, and revolving inversely. These are heated by superheated steam within, and have a surface temperature of 110° C. The milk passing between the revolving cylinders forms a thin layer on each, becomes evaporated to dryness, and is stripped off as a thin sheet of milk solids, all within a single revolution. The thin sheets are reduced by sieving to a powder, which can be compressed into tablets. Mixed with warm water the powder immediately forms a liquid having all the properties of boiled milk. The advantage to travellers of having milk in a concentrated form—the powder contains only 6 per cent. of moisture—is obvious. Moreover, the dry milk as it leaves the machine is completely sterilised. With rennet or acid we find that the mixture of dried milk and water curdles, but the curd is not coherent, a property which may add to its digestibility but destroys its value for certain culinary purposes. Owing to its cooked taste, the new product can never replace fresh milk, so that its introduction is no menace to the British milk industry; on the contrary, farmers should benefit if the milk supply associations they deal with possess this apparatus for drying any surplus over the daily requirements. The public will find that discrimination is necessary in the purchase of the dried milk, as it can be made from either whole or separated milk.

WE have received a copy of the fifth annual report of the Plymouth Municipal Museum and Art Gallery, in which an unusually large number of presentations to that institution are recorded.

IN the July issue of *Bird Notes and News* the Society for the Protection of Birds directs attention to the extent of the trade in cage-birds, and the evils attendant on the capture and maintenance in captivity of such birds. The subject is emphasised in the case of the linnet by a special leaflet, "A Linnet for Sixpence," in the course of which it is stated that sixty per cent. of these birds perish during the first week of captivity, in addition to others killed in capture and the number of hens wantonly destroyed by their captors. The practice of selling in London cock-linnets in paper-bags for sixpence is specially deprecated.

THE *Popular Science Monthly* for July contains an illustrated account by Prof. Bashford Dean of the zoological station at Misaki, Japan. The station, which was removed to Misaki in 1897, now contains two buildings with convenient workrooms, for which fittings and books are periodically sent from Tokyo in accordance with the needs of investigators. The great feature of the station is the crew of fishermen, who are accustomed to carry on their trade in deep water, with lines which may be as much as a mile in length, and often bring up rarities. The shallow water of the bay yields numerous interesting types—among others a giant Balanoglossus—while from deep water further out are obtained the remarkable shark Mitsurikina, perhaps identical with the Cretaceous Scapanorhynchus, the frilled shark (Chlamydoselachus), and one of the Port Jackson sharks, in addition to numerous interesting invertebrates, such as swarms of glass-sponges and specimens of the stalked crinoid Metacrinus.

IN No. 10 of vol. ii. of the *Circulars and Agricultural Journal* of the Royal Botanic Gardens, Ceylon, the director, Mr. J. C. Willis, gives an account of the history of the institution; originally simply a botanic garden at Peradeniya, it has gradually developed into one of the greatest botanical and agricultural establishments in the tropics, comprising six botanic gardens with a cultivated area of 256 acres in different climates and elevations, three experiment stations of a total cultivated area of 360 acres, and forest reserves for scientific purposes of 850 acres. There is a European staff of nine, including four botanists, an entomologist, and a chemist, and well equipped laboratories, library, museum, and herbarium, all open freely to workers from abroad. No less than twenty-two scientific men have visited Peradeniya for purposes of original research during the last seven years, and the institution now publishes a botanical journal devoted to pure research.

"THE Fungous Diseases of Fruits in Michigan" forms the title of a special *Bulletin* prepared by Mr. Longyear and issued by the Michigan State Agricultural College. The author has brought into a small compass the diagnoses of fungal pests which attack common fruit trees and plants, together with hints as to preventive or remedial treatment.

SEEING that no comprehensive account of the flora of Norfolk Island has been published since Endlicher's "Prodromus Floræ Norfolkicæ," which came out in 1833, the contribution to this subject presented by Mr. J. H. Maiden to the Linnean Society of New South Wales last year is eminently useful. The paper begins with a critical enumeration of the flowering plants and cryptogams, in which the author deals with a number of synonyms and doubtful references, besides adding several new records for the island. A somewhat novel feature for a flora is a separate list of plants of economic and horticultural value. The author reserves for a second part his observations as to origin and distribution.

SOME interesting ecological observations of certain swamp areas in Michigan and Arkansas counties, U.S.A., are recorded by Dr. S. M. Coulter in the fifteenth annual report of the Missouri Botanical Garden. On the island of North Maniton, in Lake Michigan, a small lake, having no outlet, is being filled up by the encroaching vegetation. The pioneer plants are the peat-mosses, followed by cranberry and leather leaf, *Cassandra calyculata*; tamarack, *Larix Americana*, and black spruce crowd on the shrubs, and as the ground gets drier deciduous trees obtain a foothold. In the swamp region of the St. Francis River two characteristic trees are found, the tupelo gum, *Nyssa uniflora*, distinguished by having a continually increasing dome-shaped base, and the bald cypress, *Taxodium distichum*, which develops a conical butt and peculiar "knees."

DR. N. ZARUDNY has returned from his last journey to Persia, and has brought back rich ornithological collections.

WE learn from the *Bulletin* of the Russian Society of Naturalists of St. Petersburg that the biological station which has been established near Alexandrovsk, on the Norman coast of the Kola peninsula, is now in working order. It is provided with all the necessary apparatus for pumping sea-water to a basin and an aquarium, as well as with a special sailing boat and all apparatus required for fishing and dragging. During last summer the exploration of the bay and its nearest surroundings proved that both yield rich material for research. The sea-bottom opposite the Dog's Cape of Catherine Island is covered with Lithothamnium, upon which there are many annelids (*Nereis pelagica, Glycera capitata*, &c.), numerous worms, the *Cucumaria frondosa* and *C. calcigera, Psolus phantapus*, many Ophiuridæ, Planariæ, Nemertinæ, a variety of crustaceans and molluscs, two Actiniæ, one of which is the *Actinoloba dianthus*, the deep-water medusa, *Pectyllis arctica*, and many other forms of life. Altogether it appears that within a distance of less than one and a half miles from the station there is already a deep-water fauna which lives at the comparatively small depth of from 20 to 70 fathoms.

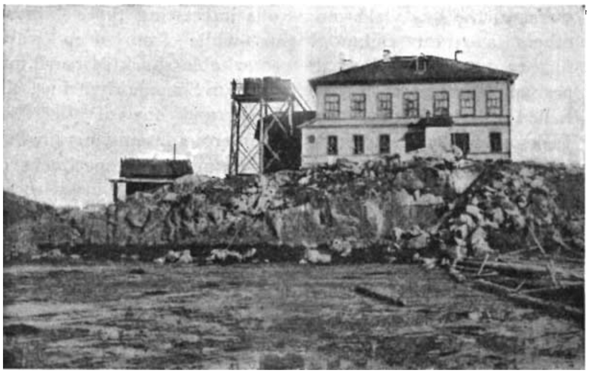

FIG. 1.—The biological station on the Norman coast of the Kola peninsula, North Russia. View from the north-west, at low water. The pumping machinery and a covered sea-water basin are shown on the left.

IT has been generally considered that the naphtha wells of the Kuban province of north-western Caucasus take their origin in the Sarmatic and Mediterranean layers of the Tertiary deposits of that region. The mining engineer, W. I. Wind, brings forward (in the *Bulletin* of the St. Petersburg Society of Naturalists, 1904, No. 4) some data tending to prove that naphtha in Kuban originates also in deeper lying Tertiary strata which consist of a dark, almost black clay, containing enormous quantities of remains of fishes (chiefly Meletta), as well as thin layers of carbonised plants.

A NEW instalment of "Flora Caucasica critica," by N. Kuznetsoff, N. Busch, and A. Fomin (fascicules 3 to 6), appears in the *Memoirs* (*Trudy*) of the St. Petersburg Society of Naturalists, vol. xxxii., part iii. A special fascicule of the same volume is devoted to the memory of A. Beketoff, and contains the following works:—"The Influence of the Concentration of Solutions on Respiration and Exchange in Plants," by V. Palladin and Mme. A. Komleva; "The Influence of Wounds on the Formation of Unassimilable Albumens and Nucleo-proteids in Plants," by I. Kovshoff; "The Vegetation of the Povyenets District of Olonets," by E. Ispolatoff; "On the Vegetation Covering the Sands in Taurida," by the same author; "The Influence of Exterior Conditions on the Division of Nuclei in the Roots of *Vicia faba*," by V. Sablin; and "On the Influence of Saccharose on the Respiration of Seeds," by S. Woicehowski.

A NEW edition of Dr. H. R. Mill's "Elementary Classbook of General Geography" has been published by Messrs. Macmillan and Co., Ltd. The book, which first appeared in 1889, was largely re-written in 1900, and has again been thoroughly revised. Recent political changes and colonial developments have been noted, and all statistics have been brought up to date by reference to the returns of the censuses of 1900 and 1901, and to recent official publications.

A SELECTION of the brilliant lectures and essays of the late Prof. W. K. Clifford, together with a biographical sketch of the author, has been published by Messrs. Macmillan and Co., Ltd., in their sixpenny series. In their cheap form these essays and addresses should be widely read, and there is every reason to hope that Clifford's influence will be increased greatly by the publication of his teachings at this small cost.

WE have received from Messrs. John J. Griffin and Sons, Ltd., a copy of a new issue of their illustrated catalogue dealing with apparatus for the study of magnetism and electricity. Among other novelties, particulars of which are given in the catalogue, we notice moving coil voltmeters and ammeters which can be obtained at a reasonable price, and apparatus for showing Prof. Elihu Thomson's experiments on the electromagnetic repulsion between an alternating electro-magnet and a conducting ring. The convenient arrangement of the catalogue and the large number of illustrations it contains should render the publication of real service.

A NINTH edition of the late Prof. Babington's "Manual of British Botany" has been published by Messrs. Gurney and Jackson. The book has been enlarged from the author's manuscripts and other sources. The work of editing the new edition has been done by Messrs. Henry and James Groves. Species, varieties, additional characters and remarks which have been inserted by the editors are printed in smaller type, and where introduced in the text are enclosed in square brackets. A fresh account of the genus Hieracium has been drawn up by Miss R. F. Thompson and included in the book. A conspectus of the groups and species from the "Handbook of British Rubi," by the Rev. W. Moyle Rogers, has, by permission, been added as an appendix.

SINCE its publication in 1894, Preston's "Theory of Heat" has been regarded as a standard work on the subject. Teachers and students will welcome the new edition which has just been published by Messrs. Macmillan and Co., Ltd. The revision, necessary in view of the recent progress made in this branch of physics, has been done by Mr. J. Rogerson Cotter, of the University of Dublin. Among the changes in the new edition may be mentioned the transference of the section on the dynamical equivalent of heat from chapter viii. to chapter iv., a few unimportant omissions, and the addition of some hundred pages of new matter. The additions have been enclosed in brackets. Mr. Cotter has succeeded in bringing the book well up to date, and in this way has ensured a continued popularity for an excellent treatise.

AN interesting and simple mechanical model devised for the purpose of illustrating to students the gas laws and the nature of Carnot's cycle is described by Dr. F. B. Kenrick in the May number of the *Journal of Physical Chemistry*.

WE have received a copy of the *Chemikalien-Zeitung*, a new journal to be published fortnightly under the editorship of Dr. R. Pauli, Berlin. The journal will be devoted to matters relating to the manufacture and application of chemical substances in the industries. One of the chief objects of the promoters is to produce by means of the fortnightly publication a work of encyclopædic character dealing with this aspect of technical chemistry.

WE have received vol. i., No. 1, of the *Memoirs* of the College of Science and Engineering, Kyoto Imperial University, a publication containing original papers by members of the university. Among other papers worthy of notice are "Synthesis of Indigo and its Methyl Derivatives," by M. Kuhara and M. Chikashigi, and "Defects of Uncarburetted Water Gas as Fuel for Laboratory Use," by M. Chikashigi and H. Matsumoto.

IN the *Physikalische Zeitschrift* (No. 12, 1904), Messrs. Elster and Geitel describe a new form of electroscopic apparatus for the investigation of feebly radio-active bodies. With this a large number of different kinds of earths, minerals, lavas, and water deposits has been examined. The activity of the sedimentary deposits from the hot springs at Baden-Baden is remarkably high, the sludge deposited at the source having approximately the same activity as uranyl potassium sulphate. As the distance of the deposited matter from the source increases, its activity falls off rapidly.

SOME recent experiments by M. Henriet communicated in the *Comptes rendus* (vol. cxxxviii. p. 1272, 1904) show that formaldehyde is present in considerable quantity in the atmosphere. The method of estimation consists in aspirating the air through a tube containing red oxide of mercury heated to 250°, in which the formaldehyde is oxidised to carbonic acid, which is then absorbed in potash bulbs. The carbonic acid already present in the original air has to be subtracted from the amount thus found, and the difference corresponds to formaldehyde. In 100 cubic metres of normal air formaldehyde is present to the extent of 2–6 grams.

IN view of the high atomic weight of radium and the remarkable ionising properties of the salts, it would not have been surprising if the electrolytic properties of radium bromide had been altogether abnormal. That this is not the case is clearly shown by the recent measurements of Kohlrausch and Henning, published in the *Verhandlung* of the German Physical Society (vol. v. pp. 144–6, March 15). The electrical conductivity is perfectly normal over the range from N/20 to N/12,000, and closely resembles that of the corresponding barium salt. The molecular conductivity rises from 100·0 to 123·6 over this range of dilution, and the limiting value is given as 125. The mobility of the radium ion is therefore 57 as compared with 56 for barium, and 53 for strontium and calcium. It is of interest to note that Runge and Precht's value for the atomic weight would give an altogether abnormal value, 67, for the ionic mobility.

WE find in the *Bulletin* of the Society of Naturalists of St. Petersburg (1904, No. 3) an interesting paper, by N. Karakash, based on a recent journey of A. Zhuravskiy and on previous exploration, giving some idea about the little known eastern portion of the tundras of Arkhangelsk, which is known as the Bolshezemelsk tundra, and lies between the Petchora and the northern Urals and the Pai-hoi Range. This portion of the tundra has not the flat and marshy character which it has in the west, but it is covered with mounds, hills, and narrow low ridges of Boulder-clay, reaching a height of 100 and occasionally 200 feet, and a length of from 12 to 20 miles. Between these mounds and hills are found countless lakes, marshes, and spaces which can be described as true patches of the tundra. All these hills are undoubtedly of morainic origin, the Boulder-clay having only been washed by water on its surface and covered here and there with sand. As to the boulders, they consist of granites, porphyrites, gneisses, and various metamorphic slates, as also of limestones and sandstones. The latter contain Devonian, Carboniferous, and Carbo-Permian fossils, such as are well known from the western slopes of the Urals, as also Permian and Jurassic fossils, such as are known further south in the basin of the Petchora. Traces of a post-Glacial sea have only been found near the shores, but it is known from the previous researches of Barbot-de-Marny, Tchernysheff and others that large spaces of north-eastern Russia, up to a level of about 120 metres, were covered by the sea during the post-Glacial period.

OUR ASTRONOMICAL COLUMN.

RADIAL VELOCITY OF THE ORION NEBULA.—From the measurement of a series of spectrograms of the three brighter stars in the trapezium of Orion, Messrs. Frost and Adams have determined the radial velocity of those parts of the nebula located by these stars. Seven plates of the star θ^1 Orionis (October, 1903, to February, 1904) gave a mean velocity for the nebula of +19·3 km., three plates (December, 1903, January and February, 1904) of the star Bond 640 gave 18·0 km., and one plate (March 8, 1903) of the Bond star 619 gave +14 km. The general mean was +18·5 km., which is slightly higher than the values obtained by previous observers, *e.g.* +17·7 km. obtained by Keeler in 1890–91. Surprise is expressed as to the low value determined for the last named star, as the plate measured was an exceptionally good one, but the observers hesitate to draw conclusions from the results obtained from one plate.

The radial velocities of the stars themselves were also determined from the dark-line spectra on the same plates, and the provisional values are given for the two Bond stars. Regarding θ^1, the peculiarities of the spectrum and the binary character of the star will necessitate the study of a much greater number of plates before definite values can be obtained. For Bond 640 a mean value of +20 km. was determined, whilst for Bond 619 a value of +48 km., strikingly greater than that of the nebula, was obtained.

The same observers also publish the results of similar